An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

September/October 2020

Published by the UK Microwave Group

In This Issue

Articles for Scatterpoint 2
Subscription Information.....2
UKµG Project support 3
UKµG Technical support 3
UKµG Chip Bank – A free service for members.....3
UK Microwave Group Contact Information.....4
Loan Equipment.....4
UK Microwave Group AGM Minutes 2020 5
Mark 3 Tripod for Portable Use......8
Microwave Frequency Doublers 11
First UKuG online Lecture.....15
FCC Orders Amateur Access to 3.5 GHz Band to "Sunset" 15
GMRT 2020 - definite cancellation.....16
Scatterpoint activity report.....17
Contests.....23
Award News.....26
For Sale.....26
For Free 27
UKuG MICROWAVE CONTEST / ACTIVITY WEEKEND CALENDAR 2020.....28
EVENTS 2020 28
80m UK Microwavers net.....28

Millimetre Lecture on 11th November by Chris G0FDZ

Clive GW4MBS on 10GHz

UK Microwave Group

Subscription Information

The following subscription rates apply.

UK £6.00 US $12.00 Europe €10.00

This basic sum is for **UKuG membership**. For this you receive Scatterpoint for **FREE** by electronic means (now internet only) via

https://groups.io/g/Scatterpoint and/or Dropbox. Also, **free access to the Chip Bank**

Please make sure that you pay the stated amounts when you renew your subs next time. If the amount is not correct your subs will be allocated on a pro-rata basis and you could miss out on a newsletter or two!

You will have to make a quick check with the membership secretary if you have forgotten the renewal date. Please try to renew in good time so that continuity of newsletter issues is maintained. Put a **renewal date reminder** somewhere prominent in your shack.

Please also note the payment methods and be meticulous with PayPal and cheque details.

PLEASE QUOTE YOUR CALLSIGN!

Payment can be made by: PayPal to

ukug@microwavers.org

or a cheque (drawn on a UK bank) payable to 'UK Microwave Group' and sent to the membership secretary (or, as a last resort, by cash sent to the Treasurer!)

Articles for Scatterpoint

News, views and articles for this newsletter are always welcome.

Please send them to

editor@microwavers.org

The CLOSING date is

the FIRST day of the month

if you want your material to be published in the next issue.

Please submit your articles in any of the following formats:

Text: txt, rtf, rtfd, doc, docx, odt, Pages

Spreadsheets: Excel, OpenOffice, Numbers

Images: tiff, png, jpg

Schematics: sch (Eagle preferred)

I can extract text and pictures from pdf files but tables can be a bit of a problem so please send these as separate files in one of the above formats.

Thank you for you co-operation.

Roger G8CUB

Reproducing articles from Scatterpoint

If you plan to reproduce an article exactly as in Scatterpoint then please contact the Editor – otherwise you need to seek permission from the original source/author.

UKµG Project support

The UK Microwave Group is pleased to encourage and support microwave projects such as Beacons, Synthesiser development, etc. Collectively UKuG has a considerable pool of knowledge and experience available, and now we can financially support worthy projects to a modest degree.

Note that this is essentially a small scale grant scheme, based on 'cash-on-results'. We are unable to provide ongoing financial support for running costs – it is important that such issues are understood at the early stages along with site clearances/licensing, etc.

The application form has a number of guidance tips on it – or just ask us if in doubt! In summary:-

- Please apply in advance of your project
- We effectively reimburse costs - cash on results (e.g. Beacon on air)
- We regret we are unable to support running costs

Application forms below should be submitted to the UKuG Secretary, after which they are reviewed/ agreed by the committee

www.microwavers.org/proj-support.htm

UKµG Technical support

One of the great things about our hobby is the idea that we give our time freely to help and encourage others, and within the UKuG there are a number of people who are prepared to (within sensible limits!) share their knowledge and, what is more important, test equipment. Our friends in America refer to such amateurs as “Elmers” but that term tends to remind me too much of that rather bumbling nemesis of Bugs Bunny, Elmer Fudd, so let’s call them Tech Support volunteers.

While this is described as a “service to members” it is not a “right of membership!”

Please understand that you, as a user of this service, must expect to fit in with the timetable and lives of the volunteers. Without a doubt, the best way to make people withdraw the service is to hassle them and complain if they cannot fit in with YOUR timetable!

Please remember that a service like our support people can provide would cost lots of money per hour professionally and it’s costing you nothing and will probably include tea and biscuits!

If anyone would like to step forward and volunteer, especially in the regions where we have no representative, please email john@g4bao.com

The current list is available at

www.microwavers.org/tech-support.htm

UKµG Chip Bank – A free service for members

By Mike Scott, G3LYP

Non-members can join the UKµG by following the non-members link on the same page and members will be able to email Mike with requests for components. All will be subject to availability, and a listing of components on the site will not be a guarantee of availability of that component.

The service is run as a free benefit to all members of the UK Microwave Group. The service may be withdrawn at the discretion of the committee if abused. Such as reselling of components.

There is an order form on the website with an address label which will make processing the orders slightly easier.

Minimum quantity of small components is 10.

These will be sent out in a small jiffy back using a second class large letter stamp. The group is currently covering this cost.

As many components are from unknown sources. It is suggested values are checked before they are used in construction. The UKµG can have no responsibility in this respect.

The catalogue is on the UKµG web site at www. microwavers.org/chipbank.htm

UK Microwave Group Contact Information

Chairman: Neil Underwood G4LDR
email: chairman@microwavers.org
located: Wiltshire IO91EC
Tel: 01980 862886

General Secretary: John Quarmby G3XDY
secretary@microwavers.org
located: Suffolk JO02OB
Tel: 01473 717830

Membership Secretary: Bryan Harber G8DKK
membership@microwavers.org
located: Hertfordshire IO91VX

Treasurer: David Millard M0GHZ
email: treasurer@microwavers.org

Scatterpoint Editor: Roger Ray G8CUB
editor@microwavers.org
located: Essex JO01DP
Tel: 01277 214406

Beacon Coordinator: Denis Stanton G0OLX
beacons@microwavers.org
located: Surrey

Scatterpoint Activity news: scatterpoint@microwavers.org
Contests & Awards Manager: G3XDY as above g3xdy@btinternet.com

Assistants

Murray Niman	Webmaster	G6JYB	g6jyb@microwavers.org
Kent Britain	USA	WA5VJB/G8EMY	wa5vjb@flash.net
Mike & Ann Stevens	Trophies	G8CUL/G8NVI	trophies@microwavers.org
Noel Matthews	ATV	G8GTZ	noel@noelandsally.net
Robin Lucas	Beaconspot	G8APZ	admin@beaconspot.uk
Chris Whitmarsh	mmWaves	G0FDZ	chris@g0fdz.com
Mike Scott	Chip Bank	G3LYP	g3lyp@btinternet.com
Paul Nickalls	Digital	G8AQA	g8aqa@microwavers.org
Heather Lomond	SDR	M0HNO	m0hno@microwavers.org
Neil Smith	Tech Support	G4DBN	neil@g4dbn.uk
Barry Lewis	RSGB uWave Manager	G4SJH	barryplewis@btinternet.com

UK Regional Reps

Martin Hall	Scotland	GM8IEM	martinhall@gorrell.co.uk
Gordon Curry	Northern Ireland	GI6ATZ	gi6atz@qsl.net
Peter Harston	Wales	GW4JQP	pharston@gmail.com

International

Kent Britain	USA	WA5VJB/G8EMY	wa5vjb@flash.net

Loan Equipment

Don't forget, UKuG has loan kit in the form of portable transceivers available to members for use on the following bands: **Contact John G4BAO for more information**

5.7GHz 10GHz 24GHz 47GHz 76GHz

UK Microwave Group AGM Minutes 2020

The AGM of the UK Microwave Group took place on 25th October 2020, by Zoom video conferencing. 35 members were present.

Minutes 2019

Minutes 2019 (as published in Scatterpoint April 2019) – no comments had been received, there were no matters arising.

Chairman's Report – Neil Underwood G4LDR

I would like to thank all committee members, officers, representatives, Scatterpoint editor, Chipbank manager and those members looking after our interests at the RSGB, IARU, CEPT and WRC19 for their continued work and support to the UKuG. At the last AGM Mike G3LYP indicated he wished to hand over the Chipbank, but as it is now mail order only he is happy to continue until Round Tables resume again. David Newman G4GLT has offered to take over the service if required.

During 2019 I attended all the Round Tables around the UK. Each one was unique in its combination of talks, equipment testing, items for sale, etc. I would like to thank the clubs and societies who organised these.

The frequency allocations we have continue to come under threat, not least the 23cm band where our sharing with radio location services is currently being reviewed as part of a study by EU regulators (i.e. Galileo).

New licence conditions ensuring we operate within existing and future international safety guidance are out for consultation, operators should expect to carry out a risk assessment of radiated field levels and show compliance with ICNIRP limits.

COVID-19 has a big impact on the microwave aspects of our hobby. This has included an initial ban on portable operating and the cancellation of all round tables since March 2020 with little prospect of them restarting soon. In November we will start a series of on-line presentations.

Since the arrival of the VK developed 122GHz systems, a number of our members have been carrying out experiments to determine performance.

Treasurer's Report – John Worsnop G4BAO

It's been another stable year for the Group's finances, with net funds increasing by around 10% to over £26,000. Due to this there is no requirement to increase subscriptions from current rates for 2020-21. Full accounts are available to view on request to the Treasurer, but the summary is below.

Item	Income	Expenditure	Balance
Opening C/A+PayPal +Deposit + petty cash balance 01/Jan/19			**£23,884.74**
Subscriptions	£3,400.99		
Chipbank donations	£9.96		
Interest	£10.00		
Round table sales	£102.00		
Misc	£3.51		
PayPal fees/other		£174.02	
RSGB Affiliation		£47.00	
Websites (inc beaconspot)		£23.98	
Beacon Support		£386.75	
Trophies		£108.00	
Chipbank Expenses		£107.84	
Trifold leaflet		£26.95	
Loan equipment insurance		£184.40	
Sub-totals excluding transfers	£3,526.46	£1,058.94	
Closing C/A+PayPal +Deposit + petty cash balance 31st Dec 2019			**£26,352.26**

J C Worsnop G4BAO
Treasurer

The group's only major external funding project this year, aside from the support it gives annually to Beaconspot.uk, has been to provide financial support towards the rebuild of the GB3FNM 13cm beacon.

Funding for 2019-20 will include new loan equipment for the 47 and 24GHz bands

Treasurer's parting thoughts

After quite a few years as ordinary member, Chairman and Treasurer, I will be standing down from the Committee at this AGM. Over my tenure as Treasurer, I hope I've run the finances to your satisfaction. We've introduced the loan equipment scheme and built and maintained a number of new and existing beacons with group funds.

As Treasurer I was, more and more, finding myself in a state of frustration with members, at not being able to spend much of the £26k that the group holds. Sadly, with a few notable exceptions, most of our members seem uninterested in using their funds for Microwave projects for themselves or to help others.
I was most disappointed this year about the failure of the Group's proposed Hayling SDR Microwave transceiver to take off as a group project, but heartened to see others outside the group's influence taking up the challenge with the successful of the Langstone Project.
The group has badly missed an opportunity and needs to learn that ideas and money are not enough. It needs passionate leaders to make projects work.
I'm not giving up microwaves, or the GHz Column, and am happy to continue (post-covid) to be the Eastern Area tech support guy. I just feel I need a bit of a break after quite a long time serving as a committee member and holding two offices.
A final thanks to our professional accountant, Graham G0KRB who's audited the accounts every year for no charge.
Treasurers role:

1. To maintain a current account on behalf of the group.
2. To maintain a savings account on behalf of the group.
3. To maintain a PayPal account on behalf of the group.
4. To maintain accounts detailing all income and expenditure of the group.
5. To present audited accounts at the AGM.
6. To present a Treasurer's report at the AGM.
7. To be a cheque signatory for the group's current account.
8. To appoint a second cheque signatory for the group's current account.
9. To inform the membership secretary of all renewal payments received.
10. To inform the membership secretary of all new members payments.
11. To pay all the group's regular bills promptly, these include equipment insurance, website-related fees, trophy fees and expenses incurred by the Chipbank.
12. To make any other payments approved by the committee.
13. To advise the committee of the general and detailed financial situation of the group.
14. To consider the financial consequences of suggested expenditure and make recommendations to the committee.

UKuG Membership – Bryan Harber G8DKK

2020	**2019**
558 Members (9/2020)	533 Members (4/2019)
82 New Members (January to December 2019)	59 New Members (January to December 2018)
22 New Members (January to April 2020)	25 New Members (January to April 2019)
48 New Members (January to Sept 2020)	
Groups.io Scatterpoint - 547 members subscribed	Groups.io Scatterpoint - 522 members subscribed
88% members pay by PayPal	85% members pay by PayPal

A question was raised by G8EMY about lifetime membership. Two lifetime members have been conferred. Further options for lifetime membership may be considered by the committee.

Election of Officers & Committee

The Treasurer John Worsnop G4BAO and the Trophy Managers Mike & Ann Stevens G8CUL/G8NVI wish to stand down. David Millard M0GHZ had volunteered for either the Trophy Manager role or Treasurer, it was agreed at the meeting that he would stand for the role of Treasurer and that Mike and Ann would remain as Trophy Managers for now. Other nominations were requested from the floor, none were forthcoming. It was proposed that the committee be elected en-bloc with no dissensions, and on a show of hands on the conference call the following were therefore elected:

Chairman	Neil Underwood	G4LDR
Treasurer	David Millard	M0GHZ
Secretary	John Quarmby	G3XDY
Membership Secretary	Bryan Harber	G8DKK
Beacon Coordinator	Denis Stanton	G0OLX
Web Master	Murray Niman	G6JYB
Contests/Awards	John Quarmby	G3XDY
24GHz and Up	Chris Whitmarsh	G0FDZ
Microwave SDR Projects	Heather Lomond	M0HMO
	Paul Nickalls	G8AQA
Technology	Neil Smith	G4DBN
Corresponding Members		
USA Liaison	Kent Britain	WA5VJB/G8EMY
Northern Ireland	Gordon Curry	GI6ATZ

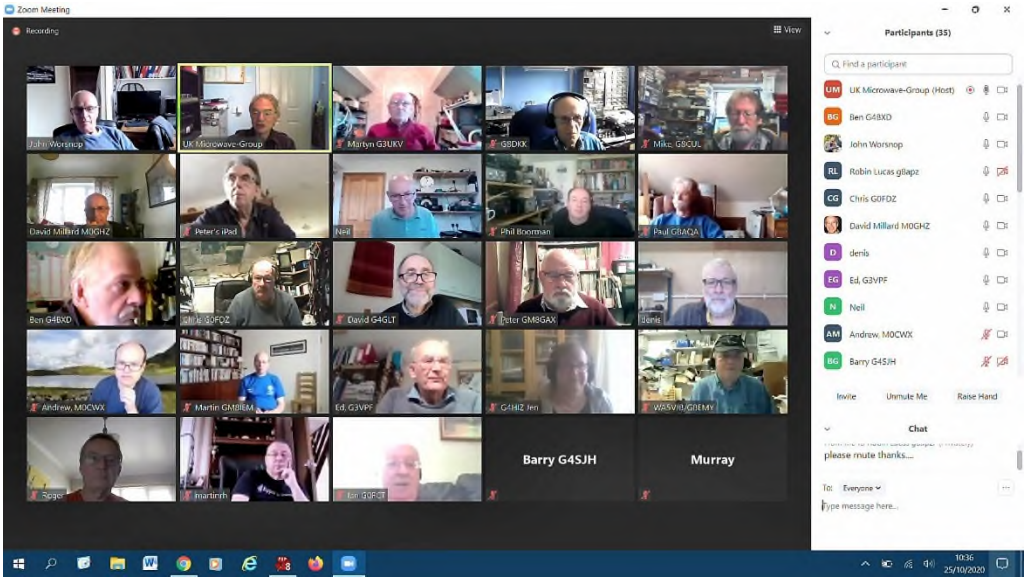
Scotland	Martin Hall	GM8IEM
Wales	Peter Harston	GW4JQP
ATV	Noel Matthews	G8GTZ
Beaconspot	Robin Lucas	G8APZ
Trophies Manager	Mike & Ann Stevens	G8CUL/G8NVI
Scatterpoint Editor	Roger Ray	G8CUB
RSGB Microwave Manager	Barry Lewis	G4SJH

Any Other Business

John G4BAO asked for proposals for new projects. Paul G8AQA mentioned a beacon project for Telford on 10GHz which is progressing, a PA may be required, but this is subject to licensing conditions as beacon ERP is usually limited. Licensing needs to be pursued before spending money.
A wide ranging discussion of the proposed new EMF limits took place. Further guidance will be published by the RSGB in due course as suitable tools are developed.
Phil Boorman G0JBA proposed a vote of thanks for the committee.
The AGM was then closed by the Chairman

Editors Comments

The AGM via Zoom this year worked particularly well. Below are couple of screen shots from Murray, which shows the action.



Mark 3 Tripod for Portable Use.

By Dave Newman G4GLT

I used again the easily available and cheap Leica GST05Ltripod. The mark 2 tripod platform was not detachable, which could be a disadvantage if you have a hatchback. Also the Mark 2 required some accuracy in getting centres of rotation to coincide. In this version the central bolt is done away with altogether and the support is entirely from the Lazy Susan bearing. This was experimental as I wasn't sure if there would be any vertical movement due to any laxity in the bearing. As it happened there is no play in the bearing and the movement is very acceptable for microwave use.

The other change is that in order to make the top platform and stub mast detachable, a sub-platform attached to the bearing was used.

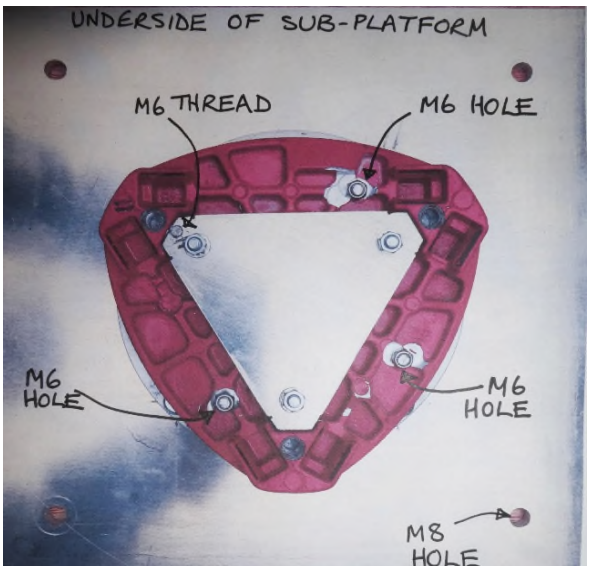
The prototype had a 190 x 190mm square sub-platform of 6mm aluminium plate, but this was found to be too small to allow me to put a brake in as well. The final size of the sub-platform was 250 x 250mm and this gave good clearance between the four threaded knurled securing knobs and the brake knob. (The 4 knobs were available on Amazon : Sourcingmap M8 39mm dia. / height 29mm)

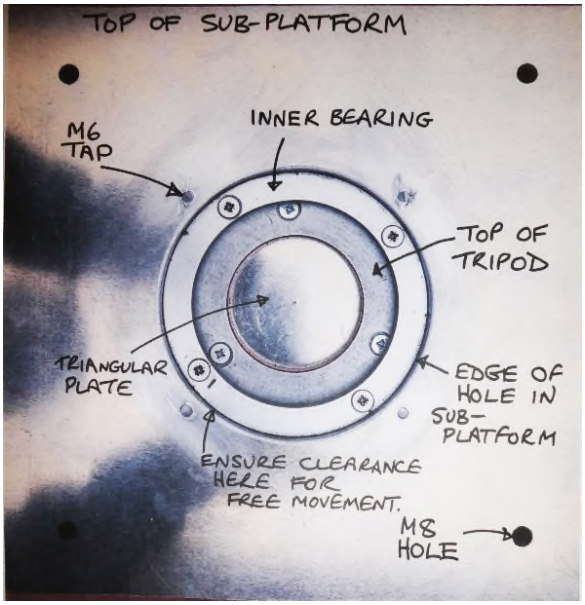
As described in the Mark 2, I put a triangular piece of 6mm aluminium plate under the main frame of the tripod having taken away the existing attachment mechanism. This was done in case I needed to

bolt the central axis later, but this was unnecessary. However, this triangle of metal was used later to tap one of the screws into, to fix the bearing to the tripod so it is necessary to put in.
The bearing used was as previously the aluminium Lazy Susan
Heavy duty Turntable bearing from Amazon 140mm
(5.5 inch) diameter, which cost me £7.99.

The top platform is 300 x 300mm of 6mm aluminium plate.
The sub-platform of 250 x 250mm square (6mm thick) should have its centre marked with a with a punch. Measure the diameter of the dividing circle between the inner and outer parts of the bearing and use half this (the radius) to mark a circle on the underside of the sub-platform. Before you lose the centre mark, do mark the circle lining up with the centres of the holes of the outer bearing. Also mark a circle for the 4 bolts involved in making the platform detachable. They should have a radius of 138mm. Drawing lines to opposite corners should locate the four M8 drilling holes.
Now remove all the metal inside the inner circle. This is easiest done by drilling a circle of holes and using appropriate round files. The four holes in the sub-platform which are for attachment to the outer part of the bearing should be tapped M6 holes (use M5 drill), and I used Loctite to make sure that they did not undo. On the top surface I carefully ground down the threads to the level of the surface with an angle grinder blade for metal.
If you place the sub-platform over the top platform and make sure they are square to each other and that the gaps around the edges are equal, then clamp the two together and drill through the existing holes, then the other four holes are easily done. The M8 bolts (40mm long) joining the 2 platforms have head uppermost then through the top platform, a locking nut is underneath, then through the sub-platform, and more thread underneath for the knurled threaded knob.
Mark the centre of the top of the triangular section with a punch. Open out the callipers and make a circle on the top of the tripod so that when measured flat across the tripod top it is the diameter of the holes of the inner bearing. This will help to get the bearing central.
Place the bearing over the top of the tripod. Try to get the circle equiposition in all the holes. Drilling the four holes in a triangular base is problematic if you look underneath. The easiest solution I found was to locate one hole at the corner of the triangle as shown in the diagram.
Note that this hole is the drill size M5 for an M6 tap.
The other 3 holes were M6 holes for M6 countersunk screws with locking nuts. I would drill the opposite hole next and attach the bearing so that drilling the other two holes is easy.
Four M6 washers must be used between the inner bearing and the top of the tripod.
It will be obvious that some of the aluminium undercarriage is in the way of tightening the nuts. Using a pillar drill and clamping the tripod base to the drilling table, the areas around the holes were milled away using a 10mm DIA, 4 flute solid carbide end mill. (EW Equipment) Take the metal away till you start taking red paint off on the flat base, then stop there. Make the holes large enough so that the nuts can be tightened easily with a socket spanner.
For the stub mast I used an L bracket (40mm dia. post/180 x 180 mm base) used on walls for satellite dishes. I bought quite few of them but on close inspection found that none of them were perfectly square on the bracket. The solution is not to bend the bracket but to get a flat bench perfectly level in two directions at right angles to each other using an accurate spirit level.
Then put M8 washers under corners until the bracket is vertical in all directions. When attaching the stub mast use these washers to get the stub-mast exactly vertical. I cut the bracket to 400mm long but use a length appropriate to the size of the dish. For the stub mast I used countersunk M8 screws with the heads underneath so as not to affect the platform spacing.
The 360 degree spirit level is as per the mark 2 .
Finally, the locking mechanism, which is essential, is as described in the mark 2. I tapped an M6 thread into the side of the tripod as deep as I could (14mm) 11mm down from the upper edge of the side of the tripod in the midline.

The M6 bolt thread I used was 32mm long and was sawn off the end of a bolt. I cut a groove in one end of this and when it is exactly right then it can be screwed in with Locktite. All of the brake is in 6mm plate aluminium and the curved small piece of metal in contact with the edge of the bearing is secured with two M3 screws with M3 taps.
I think it is easier than the Mark 2. Good luck!



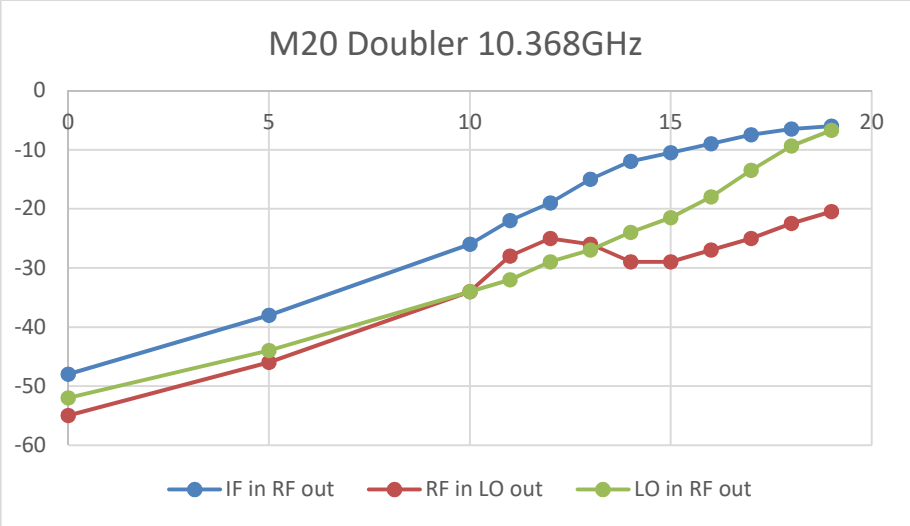


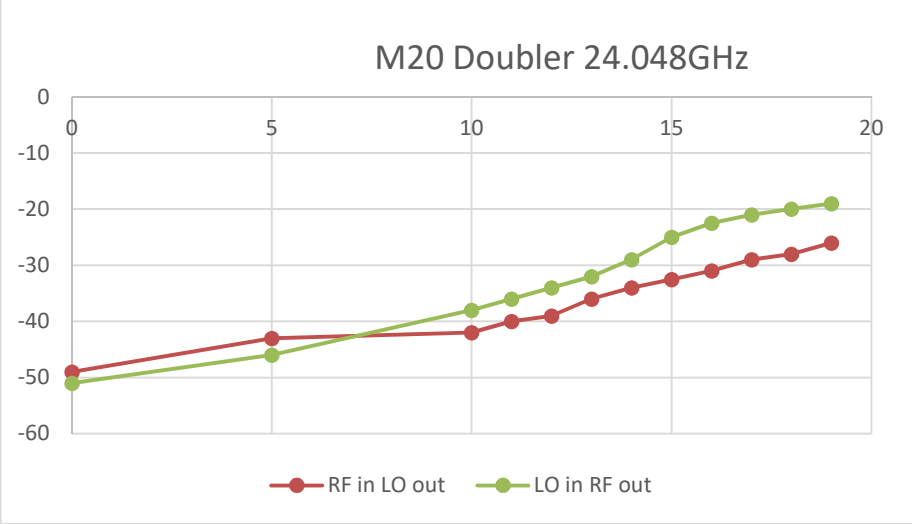
David Newman G4GLT (October 2020).

Microwave Frequency Doublers

By Roger Ray G8CUB

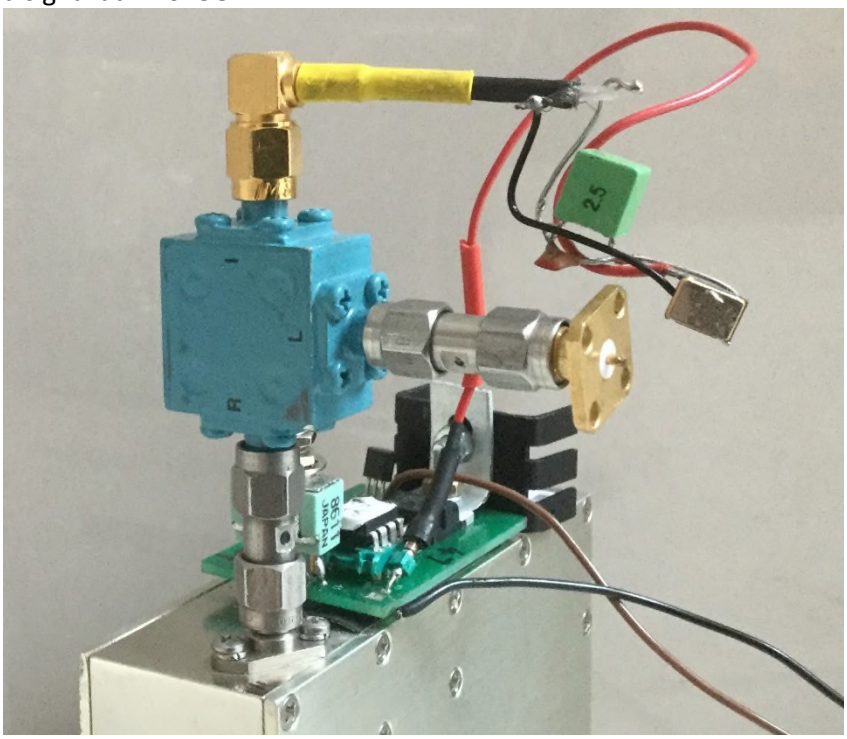
Across the microwave frequency range, it is a quite common requirement to need a doubler.
Typically to provide a local oscillator, CW transmitter, or provide a local beacon.
One simple solution to this, is to use a mixer as a doubler. A packaged mixer usually comprises a circuit with two or more diodes. Any diode produces harmonics when driven RF wise into conduction. In an SMA packaged mixer, there is a built building block that we can use.
The best performance may be driving the RF, LO port or even the IF port. As with obtaining mixing, it has to be driven hard enough, to turn on the mixer diodes. Best performance is likely to be obtained by driving them a bit harder than specification.
The graphs show a Miteq M20 mixer driven as a doubler to 10 & 24GHz. This mixer is available for about £20, and is the one I use in my 10GHz transverter, as a mixer!



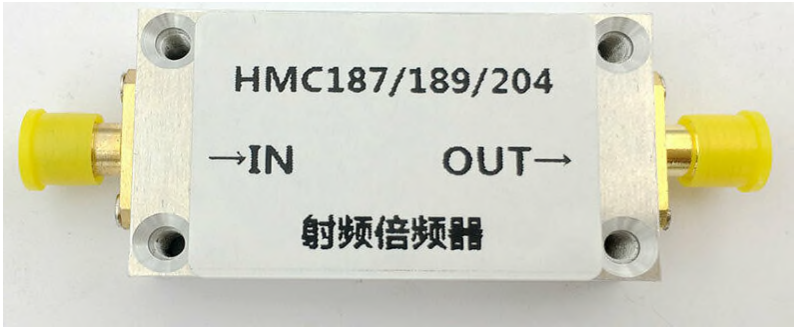


Horizontal levels are input dBm (0-19dBm). Vertical levels are output dBm
Not wanting to overdo it, I stopped at an input of +19dBm. The other important factor when using a doubler, is the ratio of the doubled output to the fundamental
In nearly all cases filtering and amplification will be required at the output frequency. A surprise result for the Miteq mixer, was that the best performance for 10GHz, was driving the IF port.
This also gave the best fundamental rejection of 5 – 8dB.
Driving the RF or LO ports produced a higher fundamental output than the X2 product.
When doubling to 24GHz, the efficiency is not great, and driving the IF is not an option, presumably due to a low pass effect on that port. Generally mixers work quite well at producing twice their intended operating frequency.

Below is another mixer used to double 12 to 24GHz. It is used as a 24GHz local beacon / check source. The Elcom synthesiser driving the RF port, is limited to 12GHz. So, in this case a 48MHz oscillator on the IF port, is mixed in, giving a signal at 24.048GHz.

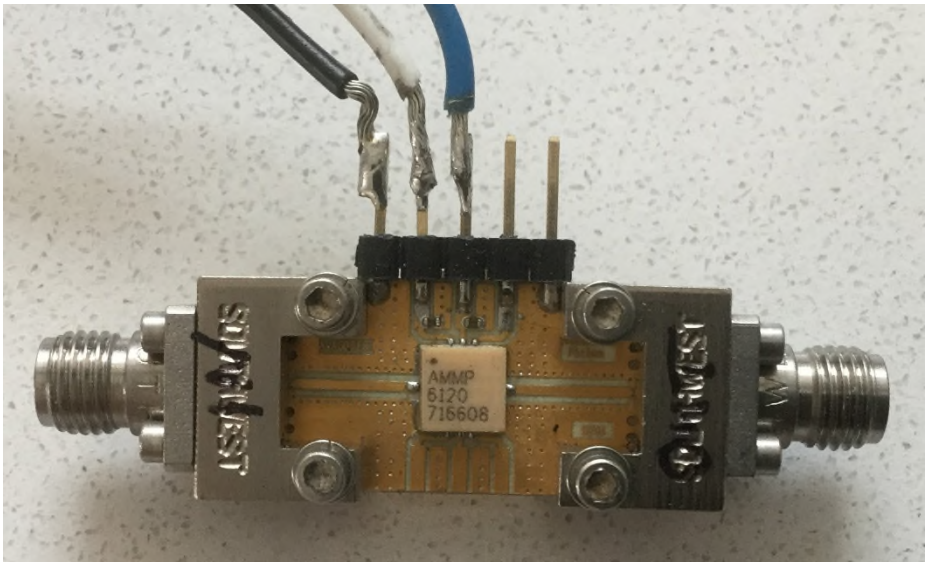


Alternative packaged doublers are available on ebay for £15-17.



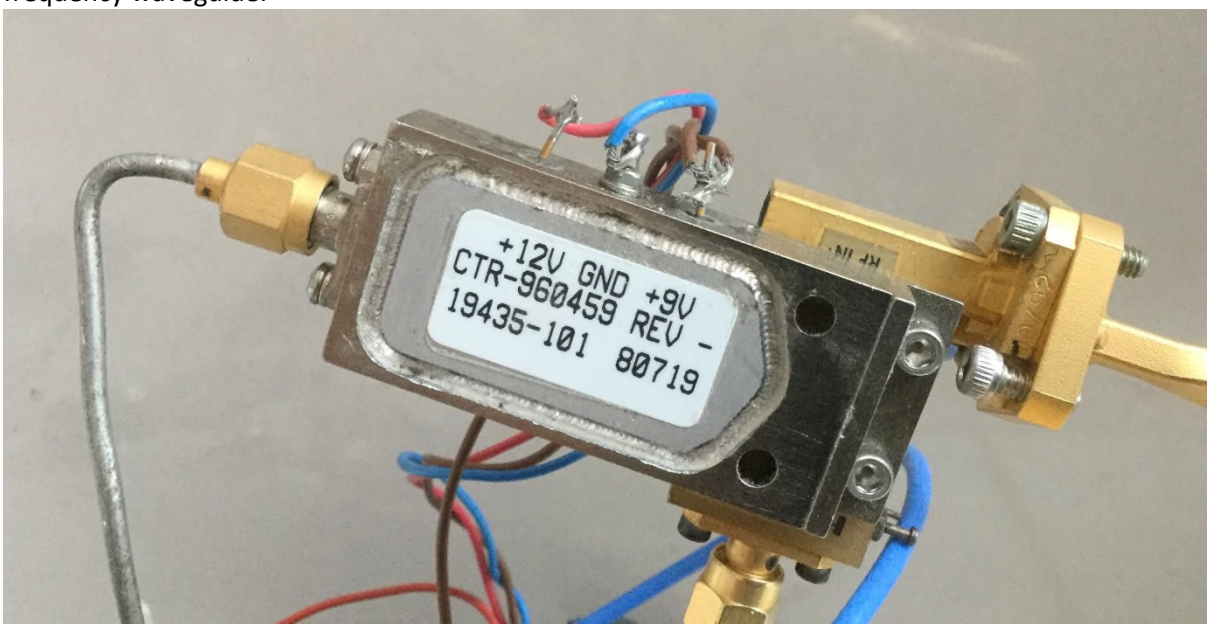
HMC 187 1.7-4GHz
HMC 189 4-8GHz
HMC 204 8-16GHz

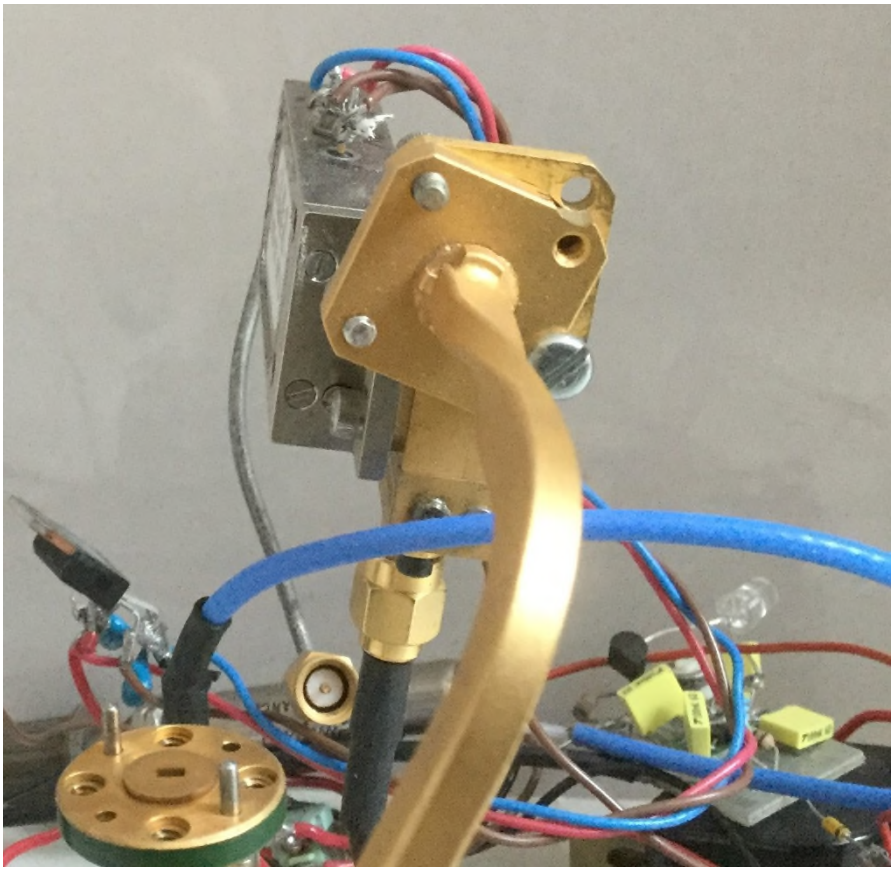
These typically have a loss of 15dB, but give reasonable rejection to the fundamental and unwanted multiples



Another commercial chip, the AMMP-6120. This is a 8-24GHz doubler/amplifier. Output is around +16dBm for +3dBm drive. It needs +5 & -1.4V supplies. It has good fundamental and X3, X4 rejection.

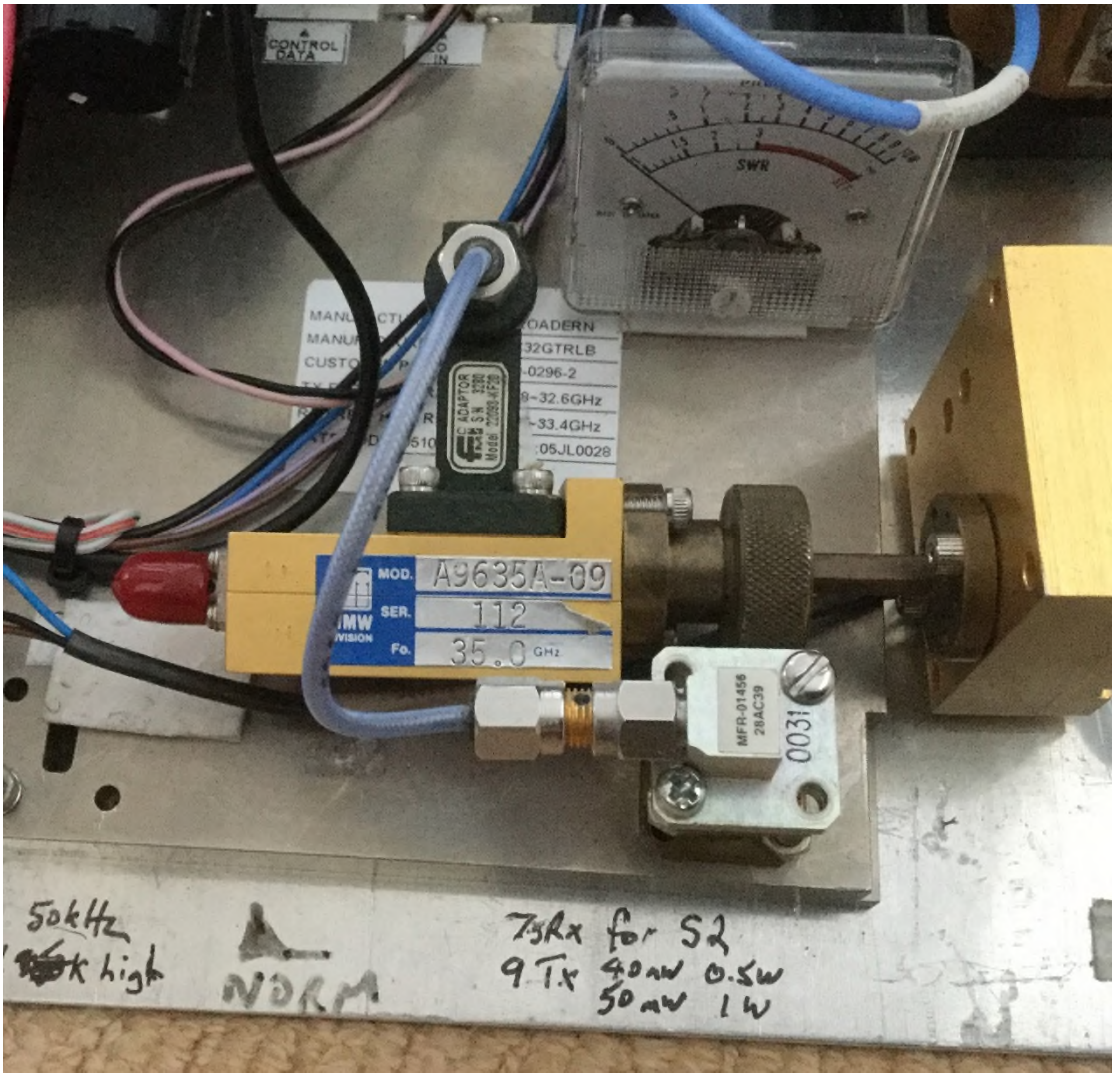
Where using a mixer as doubler really comes into its own, is with waveguide mixers. Here by selection the right output waveguide size. The waveguide cut-off can completely reject the fundamental.
The first example is a WR-28 mixer used to double to 76GHz. Looking at the output WR-15 (unusual square flange) waveguide position, it can be seen that it is offset. Peak output is usually not square or even central to the lower frequency waveguide.





The drive is around 100mW from a CTR-96049 tripler. Output is around 0.5mW at 76GHz.
There is a bit more going on here, than may be obvious. The mixer port is connected to an RF detector. The 76GHz signal is used to injection lock a 25mW Gunn oscillator. The detector on the IF port, shows an output, when the Gunn is out of lock.

Another WR-28 mixer is used as a doubler from a Broadern unit at 33GHz, to give 66GHz. This is the LO for my 76GHz transverter (10GHz IF). Again the output waveguide is twisted with an adjustable adaptor.



It is driven with around 200mW to give circa 1mW out. This then drives an amplifier to +13dBm, for the LO.
In each of these mixers it was found that driving the RF port gave the best performance.
In all cases a bit of experimentation is required!

First UKuG online Lecture

Millimetre Waves – By Chris Whitmarsh G0FDZ

A UK Microwave Group Online Lecture streamed by the BATC

Wednesday 11th November 2020 at 20:00

Chris Whitmarsh G0FDZ will be presenting his guide to the millimetre waves in this online talk. He will cover all aspects of the millimetre bands including users, propagation, antennas and feeders, basic equipment for each band to 241 GHz and beyond, and finish with mentioning the use of SDR for identifying weak signals.

There should be something in the talk for everyone from beginner on the millimetre bands to expert. However, there is no heavy maths or theory to blow your mind!

The talk will be streamed on this URL:

https://batc.org.uk/live/ukmicrowave

We look forward to welcoming all to the talk.

Please put the 9th December 2020 in your diary for the next talk in this series.

FCC Orders Amateur Access to 3.5 GHz Band to "Sunset"

10/08/2020. Despite vigorous and continuing opposition from ARRL and others, the FCC has ordered the "sunsetting" of the 3.3 – 3.5-GHz amateur radio secondary spectrum allocation, effective on November 9.

GMRT 2020 - definite cancellation

In view of the continuing situation around the Covid-19 virus, it has now been decided that the GMRT will be cancelled for 2020.

This is a great disappointment in

view of the success last year. We look forward to seeing everyone back in 2021.

An addition to Paul's article in the last Scatterpoint on an SMA Torque Wrench

Picture of the SMA tool

Paul G8AQA

Scatterpoint activity report

Activity News: September / October 2020

 By John G4BAO

Please send your activity news to: **scatterpoint@microwavers.org**

from Martyn G3UKV

Telford club uWave group have been up into the hills of Shropshire, and beyond this summer, despite all the restrictions. Efforts were concentrated on the 5.7, 10 and 24 GHz bands.

The usual /P site on Brown Clee (IO82QL83 and 84) has remained available to us, but of course we have had to obey him who must be obeyed (BJ et al).

Paul G8AQA has taken on the G3ZME/P 10GHz mantle this year, with Paul as the 'single operator' and partner Heather M0HMO logging etc. They decided 2 metre talkback is essential, but a bit of a pain to set up. So they developed the attached set-up (photo 1, 2). Very effective, and definitely highly innovative. Here they are arriving on site and setting-up the talkback antenna.

Martyn G3UKV operated the 5.7 (G6ZME/P) and 24 GHz (G3UKV/P) events, also from Brown Clee. As there were only limited sessions this year, he managed to get to the Brown Clee site and have 'social distancing' from Paul and Heather by about 30 + yards on 5.7G, and 100+ Km on 24GHz. The cunning plan was for Paul and Heather to 'roam' on the higher band, to make it more fun and to 'up' the number of QSOs. This succeeded quite spectacularly, with several QSOs 125Km plus from sites around Winter Hill, Wrexham and Derby Dales back to Shropshire.

Photos 3 and 4 show Martyn's 24GHz prime focus dish, (photo 3) with the transverter mounted directly behind the dish. He mostly operated at 'low level' in the damp heather to shelter from strong winds, with an old Yaesu 790 as the 70cm IF and usual FT 817 + HB9CV for 2m talkback (Photos 3, 4). Best DX to Paul (G6ZME/P on this occasion at IO84SA99) was 175 Km, using CW.

from Clive Elliott GW4MBS

Just a few jottings of my recent 3cm activity from Wales. Up until last month it was exactly 35 years since my last QSO on the band and quite a few changes have taken place! Operating on 3cm from a valley (IO71XW74VJ) where there is no mobile phone signal is the height of lunacy/optimism. I have yet to hear a signal, other than one I have generated myself, from down there. I am in the process of assembling a 10W rig to be mounted at the top of a 9m Hilomast.

In the meantime, portable operation with a 3.5w PA and a Sky dish has been encouraging after no end of frustrations. Although surrounded by hills and mountains it can be a long journey to find a site that offers good take off in all directions. So, I have to make do with what is nearby and easily accessible. I have been lucky to find a site only 3km away (IO71XW37GP).

It offers a clear take off from SE to SW from here I can often hear GB3SCX, occasionally GB3KBQ (but 30 deg off correct heading!) and G4UVZ (Taunton) who pounds in at 59. It is a pity that so few stations lie in this quadrant of coverage.

The photo shows the road heading off NE and behind is the reason that in the contest on 27th Sept half a dozen tests failed in that direction, although one was successful. In the end I had a total of 4 QSOs which I found something of a relief.

It was suggested that I should find a better location. But that is not so easy, despite using a Land Rover, round here you cannot simply pull onto the verge. Many verges have deep drainage ditches disguised by thick vegetation or the grass is filled with reeds that are a clear sign of marshy ground. Deep ruts, even from tractors that have become stuck, are testimony to this.

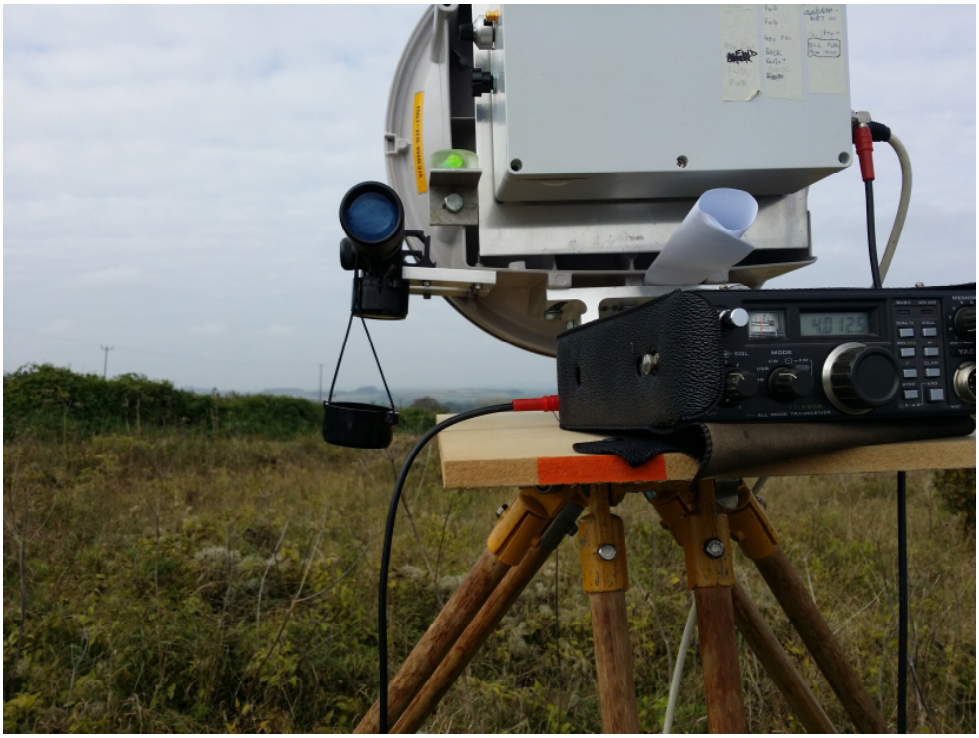
Operating with a tripod from car park offering a clear take-off is ideal. But we don't have car parks round here, the best chance of finding terra firma is in a gateway. Often there will be bushes, stone walls, fencing and trees. I am normally able to overcome this by extending one of my two Clark masts permanently fitted to the vehicle, up to 8m. This also has the advantage being able to operate with less chance of upsetting landowners than mounting a tripod or mast on the ground. This is especially useful in a National Park, National Trust land or where council or other busy bodies feel they have powers to interfere.

I first operated in this manner in 1981 with a fold-down dish permanently fitted to the base of a Decca radar scanner mounted on the roof.

Clive Elliott GW4MBS (ex-G8ADP)

From John G8ACE

Four of us did some 122GHz testing in central southern UK, during the 18th October 24-76 GHz contest day. Neil G4LDR and me, together with Noel G8GTZ 14.5Km away and David G1EHF 26.5Km away.
The weather was really unsuitable. The humidity was forecast to be not less than 70% although at 14.00 I was measuring 59%. This made the gas loss ~1dB/Km again which is a pretty bad amount to add to path loss. My experience is as the UK never gets much lower humidity than this we are always going to have difficulty with dx distances unless going for frostbite which again doesn't happen that often. Setup was lengthy, waiting for some sun to get a mirror reflection to pinpoint the bearing which did make it through the water vapour gloom eventually. Results were both stations incoming were audible on CW but not very strong. My 3.3mW Tx was FM readable with both stations. That's a first for myself having lengthy 122GHz FM overs. As and when there is video available, I will post it on my YouTube channel. Next step is to build a higher power Tx and hopefully increase antenna gains further. The water vapour gloom can be seen in the picture, as no distant horizon features are visible.



G8ACE's 122GHz equipment

From Dave G1EHF

A number of us took the opportunity during the mmWave Contest on 18th October to participate in the 122 GHz activity session. I was located throughout at Combe Gibbet (IO91GI25) and had two successful tests:
Firstly, with John G8ACE/P, who was near Stockbridge (IO91GC68), together with Neil G4LDR/P. The distance was 26.5 km and with a rather misty horizon we weren't expecting too much. I was using my VK3CV based system (~0.5 mW) with 30 cm 50 GHz dish and John a multiplier-based TX (~2.3 mW) and VK RX. The first problem was getting a visual on each other for dish alignment through the gloom. As the sun started to peep through the clouds, I quickly grabbed my mirror and started waving it around and John caught a brief reflection and aimed his dish. I then adjusted the dish at my end and found a weak carrier on 122.40001 GHz, around 10 kHz high as suggested by John. Using 144 MHz I fed back my 122G RX signal and John peaked his dish. I then peaked my end and we were very pleased that a nearly fully quietened NBFM signal was resolved. On receive, John could copy my carrier which was too weak for FM but CW copy would have been possible. However, there was some frequency instability which made it tricky even with Neil's assistance! At 26.5 km, we were both very pleased with this result and John plans to release a video of the event. I believe Neil still has work to do on his 122G antenna. Later, Noel G8GTZ/P headed for a site near the village of Peasemore (IO91HL86) and we tried between our two VK based systems. Noel was using a 30 cm dish from a surplus 38 GHz link. Again, it took some time to find a signal but with much dish scanning and SDR observation at Noel's end we managed to find each other and copy the CW beacons from each end. Not strong enough signals for NBFM but still good considering the distance of 17 km and the poor visibility conditions.
We all have plans to continue testing and improving our systems based upon these successes.

From Neil G4LDR.

On Wednesday the 14th October, Dave G4FRE, Noel G8GTZ and Neil G4LDR carried out a series of tests on 47 and 76GHz using narrowband and DATV. Noel was again using the UKuG 76GHz loan system.

Dave and Noel setup on Coombe Gibbet, Berkshire (IO91GI25) and Neil near Stockbridge, Hampshire (IO91GC68). Signals were 59+ narrowband on both bands over the 27km path. DATV pictures were then exchanged on both bands (first DATV QSO on 47GHz for G4LDR). With signals being so strong it was decided to try a second path of nearly twice the distance. G4FRE/P and G8GTZ/P relocated to Coombe PMR site (IO91GI61) whilst G4LDR drove to Butser Hill near Petersfield in Hampshire (IO90MX13), the path length being 52km. Narrow band signals on 47GHz were extremely strong but on 76GHz were nothing like as strong as on the shorter path being about 20dB over S9 despite Dave's

300mW of TX power. There were rain showers on the path at the time of our tests with losses due to the humidity being relatively high. A two way DATV contact on 47GHz was established quickly and at 52km is a new UK distance record. We were not as lucky with 76GHz. The DATV receiver at the G4LDR/P end of the link developed a fault so no pictures from G4FRE/P were received and the lower TX power of 15mW of G4LDR/P was not seen by G4FRE/P or G8GTZ/P. Based on the strength of the 76GHz narrow band signal, reduced bandwidth DATV would probably have been possible (at least one way), although other factors like phase distortion can prevent successful DATV contacts on 76GHz. We all agreed it was a good day out and we are hoping to do more testing during the winter on a cold clear day when absolute humidity levels will be low resulting in lower path losses.

G4FRE's equipment for 76GHz

G8GTZ's equipment

From John G4BAO

September/October was a quiet month for GHz QSOs from the Fen Edge, not helped by the failure of my 24GHz terrestrial system early in October. I've not had the chance to get it down and fix it yet. My 24GHz EME system is taking shape nicely though. The transverter module is done and am currently plucking up the courage to power up the late G4EAT's 25Watt TWT! I don't want to become "the late G4BAO" if I get the installation of 3.6kV supply wrong!

I did have a few QSOs though. A bit of Tropo on the 20th September brought a rare FT8 QSO on 1.3GHz with DF5VAE (JO64) at over 885km plus an SSB QSO with DG1KDD (JO31LE) at 480km. On the same day on 3.4GHz I was pleased to work G1LPS (IO94EQ) at 51 both ways via SSB aircraft Scatter at 295km. Chanting callsigns and "Roger, Roger" is quite therapeutic and reminded me of those early 144MHz SSB meteor Scatter skeds back in the 70s/80s before the dawn of digimodes.

On the topic of digimodes, my only other notable QSOs were on 10GHz EME using QRA64D. On the 19th of September with W3SZ (FN1Ø) and on the 10th October W5LUA (EM13QC). Bringing my confirmed squares count on 10GHz all modes to 30 out of 47 worked, enabling me to put in for a 30 square sticker for my UK Microwave Group squares award.

Contests

September 122GHz – 248GHz Contest 2020

This year all the activity focused on 122GHz with the advent of equipment based on automotive radar transceiver on a chip devices used by G4LDR/P and G0FDZ/P. John G8ACE/P takes the honours with two 27km contacts with G0FDZ/P and G8CUB/P.

Log accuracy was questionable for this event, please take care when recording the information sent and received. For adjudication purposes, the sending station is assumed to record correctly what is sent.

73

John G3XDY

UKuG Contest Manager

122GHz Contest September 2020

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX kms
1	G8ACE/P	IO91GC68	2	54	G8CUB/P	27
2	G0FDZ/P	IO91GI25	3	43	G4LDR/P	27
3	G8CUB/P	IO91GI25	2	29	G8ACE/P	27
4	G4LDR/P	IO91GC68	1	14	G0FDZ/P	27*

* One way QSO

24GHz/47GHz/76GHz Contest October 2020 and mm-wave Championship

As in 2019 the last event of the mm-wave series saw the best entry level of the year on 24GHz, with 11 stations submitting logs this year. Congratulations go to Martyn G3UKV/P who was the clear winner, aided by good DX contacts with G6ZME/P (Paul G8AQA) roving in Lancashire. Roving boosted scores for all the entrants, with runner up Pete G1DFL/P operating from no fewer than four locations in the home-counties.

On 47GHz Roger G8CUB/P worked Chris G0FDZ/P over two one way paths to share first place.

On 76GHz Neil G4LDR/P and Noel G8GTZ/P share the spoils with their 17km QSO.

This was the last event in the curtailed mm-wave series for 2020, the final scores are summed across the three sessions that took place. Despite (maybe because of?) the impact of Coronavirus entries are higher on all three bands this year.
On 24GHz Martyn G3UKV/P is the clear leader with two winning sessions. Roger G8CUB/P was the runner up. Robin G8APZ was the only fixed station entrant.
Roger G8CUB/P takes first place on 47GHz, winning all three sessions, with Dave G4FRE/P as the runner up.
76GHz sees Roger G8CUB/P also take first place, with Neil G4LDR/P runner up. Roger won two sessions and Neil one.
Congratulations to all the winners and runners up. Martyn G3UKV/P will receive the G0RRJ Memorial Trophy for 24GHz, and the 47GHz Trophy will go to Roger G8CUB/P.

John G3XDY
UKuG Contest Manager

24GHz Contest October 2020

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX kms
1	G3UKV/P	IO82QL83	5	575	G6ZME/P	175
2	G1DFL/P	IO91LO78	7	404	G3UKV/P	136
3	G6ZME/P	IO83SO17	2	303	G3UKV/P	175
4	G1EHF/P	IO91GI25	8	226	G1DFL/P	44
5	G8CUB/P	JO01DO30	5	222	G0JBA	72
6	G4SJH/P	IO91JB00	8	210	G1EHF/P	39
7	G8APZ	JO01DO65	3	186	G3XDY	82
8	G4LDR/P	IO91GC68	3	71	G1EHF/P	27
9	G0FDZ/P	JO01FK60	2	57	G8CUB/P	34
10	G8ACE/P	IO91GC68	2	44	G4SJH/P	27
11	G8GTZ/P	IO91EE26	2	34	G8ACE/P	17

47GHz Contest October 2020

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX kms
1=	G8CUB/P	JO01DO30	2	29	G0FDZ/P	34
1=	G0FDZ/P	JO01FK60	2	29	G8CUB/P	34

76GHz Contest October 2020

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1=	G4LDR/P	IO91GC68	1	17	G8GTZ/P	17
1=	G8GTZ/P	IO91EE26	1	17	G4LDR/P	17

24/47/76GHz Championship Tables 2020

Final positions after all three events

24GHz

Pos	Callsign	19/07/2020	13/09/2020	18/10/2020	**TOTAL**
1	G3UKV/P	617	1000	1000	2617
2	G8CUB/P	861	392	386	1639
3	G1DFL/P	491	303	703	1497
4	G4FRE/P	528	790	0	1318
5	G4SJH/P	0	821	365	1186
6	G4LDR/P	328	685	123	1136
7	GW3TKH/P	1000	0	0	1000
8	G1EHF/P	516	0	393	909
9	GW4HQX/P	873	0	0	873
10	M(W)0HMO/P	0	670	0	670
11	G6ZME/P	0	0	527	527
12	G8APZ	0	0	323	323
13	G8ACE/P	0	237	77	314
14	G8GKQ/P	0	157	0	157
15	G0FDZ/P	0	0	99	99
16	G8GTZ/P	0	0	59	59

47GHz

Pos	Callsign	19/07/2020	13/09/2020	18/10/2020	TOTAL
1	G8CUB/P	1000	1000	1000	3000
2	G4FRE/P	444	879	0	1323
3	G0FDZ/P	0	0	1000	1000
4	G4LDR/P	172	672	0	844
5	GW3TKH/P	500	0	0	500
6	G8ACE/P	0	336	0	336
7	GW4HQX/P	222	0	0	222

76GHz

Pos	Callsign	19/07/2020	13/09/2020	18/10/2020	TOTAL
1	G8CUB/P	1000	1000	0	2000
2	G4LDR/P	345	325	1000	1670
3	G8GTZ/P	0	0	1000	1000
4	GW3TKH/P	662	0	0	662
5	GW4HQX/P	662	0	0	662
6	G8ACE/P	0	456	0	456

Award News

A welcome application for the 30 squares award on 10GHz was received at the end of October from John G4BAO.
John submitted an additional 10 cards to gain the award sticker, these included five EME QSOs with stations in the USA and Europe worked using the QRA64 mode. Award number three sticker is now on its way to Cambridgeshire.

Applications for awards are very welcome, and are free to members. All the details and forms are on the UKuG website at https://www.microwavers.org/awards.htm

73

John G3XDY
UKuG Awards Manager

For Sale

https://isotropic.network/app/uploads/2018/03/2.4M-General-Dynamics-Antenna-Assembly-Manual-Series-1241.pdf

A Prodelin (General Dynamics) 1241, 2.4m offset dish. Good up to 24GHz.
Ex-Dubai. Offered at cost for £475.00. Bought via Eddy Jespers ON7UN in July this year.
A case of my eyes being larger than my garden……

Includes the dish in four petals, all mounting, including feed arms etc. But, not including the large rectangular grid plate shown at the bottom of the picture – it was too heavy.

Collection only from Brentwood.
Contact Roger 07900 261121

For Free

A couple of dishes that are surplus to requirements. They are FOC to anyone who wants one or two. They have been superseded by bigger ones. To quote Noel "If your antenna didn't fall down over winter it wasn't big enough".

One was from G4BAO and has an equatorial mount. It was never used here. Dia. 1450, Fl 552, F/D 0.38.

The other is 1200 effective dia. 225 deep. Has damaged WG14 feed complete with window and pressurisation section.

They are located at IO82QN. I might be able to deliver but am not travelling as much as usual. Collection any time they would fit on a roof rack. Please telephone for collection/delivery or more details 01694 771441 Paul G8AQA

UKuG MICROWAVE CONTEST / ACTIVITY WEEKEND CALENDAR 2020

Dates, 2020	Time UTC	Contest name	Certificates
15 -Nov	1000 - 1400	5th Low band 1.3/2.3/3.4GHz	F, P,L
28-29 Nov		Activity Weekend	
26-27 Dec		Activity Weekend	

Key: F Fixed / home station
P Portable L
Low-power (<10W on 1.3-3.4GHz, <1W on 5.7/10GHz)

EVENTS 2020

Events may be subject to cancellation due to the Coronavirus
For latest information consult https://microwavers.org

2020

November 7	Scottish Round Table Cancelled	www.gmroundtable.org.uk/

2021

January	Heelweg Cancelled	www.pamicrowaves.nl/
January 10-15	European Microwave Week, Utrecht	www.eumweek.com/
April 24	CJ-2021, Seigy	www.cj.r-e-f.org/
May 21-23	Hamvention, Dayton	www.hamvention.org
June 25-27	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de
August 19-22	EME 2021, Prague	www.eme2020.cz
October 10-15	European Microwave Week, London, Excel	www.eumweek.com/

80m UK Microwavers net

Tuesdays 08:30 local on 3626 kHz (+/- QRM)

73 Martyn Vincent G3UKV